KNORZ, DR. 1848. Über den von Hrn. Decaisne angegebenen Parasitismus der Rhinanthaceen. Bot. Zeit. 6:239-241.
KOCH, L. 1887. Über die direkte Ausnützung vegetabilischer Reste durch bestimmte chlorophyllhaltige Pflanzen. Ber. Deutsch. Bot. Ges. 5:350-364.
MARIE-VICTORIN, F. 1935. Flore Laurentienne. Imprimerie de la Salle, Montréal.
PENNELL, F. 1935. The Scrophulariaceae of eastern temperate North America. Monogr. Acad. Phila. 1:1-650.
SHREVE, F., M. CHRYSLER, F. BLODGETT, AND F. BESLEY. 1910. The Plant Life of Maryland. Md. Weather Service, Baltimore.
SPERLICH, A. 1902. Beiträge zur Kenntniss der Inhaltsstoffe in den Saugorganen der grünen Rhinanthaceen. Beih. Bot. Centr. 11: 437-485.

FURTHER NOTES ON THE DISTRIBUTION OF BIDENS CONNATA VARS. PINNATA AND GRACILIPES

EARL EDWARD SHERFF

Fassett (Rhodora 30: 31-35, Plate 160. 1928) listed the six varieties of *Bidens connata* Muhl. known to him in the State of Wisconsin: vars. *typica (connata), fallax, petiolata, ambiversa, anomala,* and *pinnata.* For the last of these, var. *pinnata* Wats., he listed but two collections from Wisconsin, these from Polk County (see also Aldrich & Fassett, Science 70: 45. 1929). Subsequently he collected, either alone or with some of his students, numerous specimens of var. *pinnata* from various other counties in northwestern Wisconsin. Through the kindness of Dr. H. Iltis of the Department of Botany of the University of Wisconsin, I have been permitted to examine those specimens critically. Moreover, in early September of 1961, I made visits to some of the localities where Fassett had collected and this permitted me to observe the living specimens in their native habitats. Suites of specimens were obtained to distribute to herbaria. As a contribution to the study of Wisconsin's flora, there follows here a condensed list of all Wisconsin specimens of var. *pinnata* studied by me. My own collections may be found represented in the Herbarium of the Chicago Natural History Museum (F); the others are in the Herbarium of the University of Wisconsin:

CHIPPEWA COUNTY: *N. C. Fassett, John Budd, & C. L. Brynildson 22695*, sandy shore of Bass Lake, 12 miles north of Bloomer, Oct. 2, 1949. BARRON COUNTY: *W. T. McLaughlin 1020*, sandy shore of Crystal Lake, Comstock, Aug. 29, 1929; *McLaughlin 1021*, sandy shore of Horseshoe Lake, Turtle Lake, Aug. 28, 1929; *McLaughlin 1055*, sandy shore of Silver Lake, Cumberland, Aug. 29, 1929. POLK COUNTY: *N. C. Fassett 7891*, sandy shore of Bass Lake, 9 miles west of Luck, Sept. 23, 1928; *Fassett & L. R. Wilson 4016*, sandy shore of Poplar Lake, Osceola, Sept. 4, 1927 (3 sheets); *W. T. McLaughlin 1024*, sandy shore of Pine Lake, Star Prairie; *McLaughlin 1026*, narrow sand strip, Twin Lake, Amery, Aug. 25, 1929; *McLaughlin 1030*, grass-invaded shore, small pond, Star Prairie, Aug. 26, 1929. WASHBURN COUNTY: *N. C. Fassett 7900*, sandy shore of Shell Lake, Shell Lake, Sept. 22, 1928; *Fassett 7901*, same place and date; *Fassett 7906*, sandy shore of Silver Lake, Lampson, Sept. 15, 1928; *Fassett 7907*, sandy shore of small lake 2 miles northeast of Sand Lake, 12 miles northwest of Minong, Sept. 6, 1928; *Fassett 7911*, wet, sandy shore of Sand Lake, 12 miles northwest of Minong, Sept. 6, 1928; *Fassett 7912*, at water's edge, sandy shore of Wood Lake, 12 miles northwest of Minong, Sept. 6, 1928; *Fassett 11971*, sandy shore of same lake, same date; *Fassett 17644*, bog, Devil's Lake, Sarona, Sept. 14, 1935 (2 sheets); *Fassett 17645*, sandy shore of Bass Lake, Sarona, Sept. 14, 1935; *Fassett & W. T. McLaughlin 10891*, shore of Mathews Lake, Trego, Sept. 11, 1929; *Fassett & McLaughlin 10892*, shore of Cable Lake, Spooner, Sept. 12, 1929; *Fassett & McLaughlin 10893*, sandy shore of McKinley Lake, Trego, Sept. 12, 1929; *Fassett & McLaughlin 10894*, shore of Cable Lake, Spooner, Sept. 12, 1929; *Fassett & McLaughlin 10895*, sandy shore of Horseshoe Lake, Minong, Sept. 12, 1929; *Fassett & McLaughlin 10896*, shore of McLain Lake, Minong, Sept. 12, 1929; *Earl E. Sherff XY6002*, sandy and stony east shore of Silver Lake, south of Minong, Sept. 1, 1961; *Sherff XY6003*, sandy west shore of Shell Lake, Shell Lake, Sept. 1, 1961; *Sherff XY6004*, sandy shore of Little Long Lake, west of Spooner, Sept. 1, 1961; *Homer Stevens 187*, bog beyond "Hogin's" on Route M, Aug. 28, 1947. BURNETT COUNTY: *N. C. Fassett 1214*, sandy shore of Devil's Lake, Webster, Sept. 6, 1929; *Fassett 7898*, sandy shore of Long Lake, Hertel, Sept. 19, 1928; *Fassett 7899*, sandy shore of Crooked Lake, Siren, Sept. 19, 1928; *Fassett 7902*, sandy shore of Clear Lake, Siren, Sept. 19, 1928; *Fassett 7904*, shore of Hanscon [Hanscomb] Lake, Webb Lake, Sept. 21, 1928; *Fassett 7905*, sandy shores of Long Lake and Sucker Lake, Webb Lake, Sept. 21, 1928; *Fassett & J. W. Thomson 18715*, shore of Fish Lake, south of Webb Lake, Sept. 17, 1937; *W. T. McLaughlin 1018*, sandy shore of Clear Lake, Siren, Aug. 21, 1929; *McLaughlin 1019*, sandy shore of Conners Lake, Webster, Aug. 19, 1929; *McLaughlin 1025*, sandy shore of Macaboyne Lake, Webb Lake, Aug. 18, 1929; *McLaughlin 1028*, sandy shore of Devil's Lake, Webster, Sept. 1, 1929; *McLaughlin 1032*, sandy shore of Fish Lake, Webb Lake, Aug. 17, 1929; *McLaughlin 1033*, sandy shore of a

small lake, Webb Lake, Sept. 11, 1929; *McLaughlin 1035*, sandy shore of Ham Lake, Webster, Sept. 10, 1929; *McLaughlin 1036*, sandy shore of Long Lake, Webb Lake, Sept. 11, 1929; *McLaughlin 1037*, sandy shore of Sucker Lake, Webb Lake, Sept. 11, 1929; *McLaughlin 1038*, sandy shore of small lake north of Sand Lake, Gaslyn, Sept. 4, 1929; *McLaughlin 1039*, sandy shore of Loon Lake, Danbury, Sept. 3, 1929; *McLaughlin 1040*, sandy shore of Oak Lake, Gaslyn, Aug. 24, 1929; *McLaughlin 1041*, sandy shore of Long Lake, Hertel, Aug. 15, 1929; *McLaughlin 1042*, sandy shore of Birch Island Lake, Birch Island, Aug. 17, 1929; *Earl E. Sherff XY6005*, sandy shore of Crooked Lake, 1 mile north of Siren, Sept. 2, 1961, a form approaching in its foliage var. *gracilipes* Fern.; *Sherff XY6007*, sandy shore of Benach Lake (N. W. corner of sect. 29, tshp. 40N., R.15W.), ±27 miles (by road) northwest of Spooner, Sept. 2, 1961; *Sherff XY6008*, sandy shore of Mallard Lake, Sept. 2, 1961; *Sherff XY6009*, sandy shore of small lake near Mallard Lake, Sept. 2, 1961; *Sherff XY6010*, very abundant on sandy north shore of North Sand Lake, northwest of Gaslyn, Sept. 2, 1961. BAYFIELD COUNTY: *N. C. Fassett 7884*, sandy shore of McDonald Lake, Barnes, Sept. 11, 1928; *Fassett 7894*, same place and date; *Fassett 7903*, sandy shore of Pigeon Lake, west of Drummond, Sept. 3, 1928; *Fassett 7914*, sandy shore of Lake Ruth, Iron River, Sept. 3, 1928; *Fassett 7915* (1-2 meters from water, sandy shore of) and *7916* (at water's edge of) Island Lake, Barnes, Aug. 29, 1928; *Fassett 7946*, muddy shore of Lake Ellison, Barnes, Sept. 2, 1928; *W. T. McLaughlin 1017*, sandy shore of Lake Ruth, Iron River, Sept. 13, 1930; *Earl E. Sherff XY6001*, sandy south shore of Pigeon Lake, west of Drummond, Sept. 1, 1961. DOUGLAS COUNTY: *G. H. Conklin*, sandy shore of Whitefish Lake, Aug. 11, 1929; *N. C. Fassett 7892*, sandy shore of Wilderness Lake or Pattangel Lake,* Barnes, Sept. 15, 1929; *Fassett 7897*, sandy shore of Murray Lake, 12 miles east of Solon Springs, Sept. 2, 1928; *Fassett 7908*, under eaves of shed on sandy shore of Loon Lake, Wascott, Sept. 6, 1928 (2 sheets, "a" and "b"); *Fassett 7909*, wet, sandy shore of Whitefish Lake, Wascott, Sept. 6, 1928; *Fassett 7910*, same place and date; *Fassett 11970*, sandy shore of Halfway Lake, Gordon, Aug. 18, 1929; *W. T. McLaughlin 1016*, sandy shore of Simms Lake, Sept. 13, 1930; *McLaughlin 1027*, sandy shore of Halfway Lake, 2 miles south of Gordon, Sept. 13, 1930.

Particular notice was given the var. *pinnata* specimens in the live state to see if there were transitions to the less compound types of leaves characteristic of *B. connata* var. *gracilipes* Fern., a variety found in similar habitats, edges of sandy lake shores, at various localities in Wisconsin and

*Fassett's label gives the location for the lakes as Sect. 6, T. 45 N. R. 8 W. in Douglas County, but Barnes itself is across the county border in Bayfield County.

often interspersed with var. *pinnata*. No definite transitions of var. *pinnata* into var. *gracilipes* were found.

As previously stated in my revisional treatment of *Bidens* (Sherff, The Genus Bidens, Bot. Ser. Field Mus. Nat. Hist. **16**: 262. 1937), the var. *pinnata* was known to range geographically through parts of Minnesota (where the type had been collected at Richfield in Hennepin County) and Wisconsin. On several trips in the autumn of 1961 to lakes in western Michigan, I was unable to find var. *pinnata*, even though the lakes possessed sandy shores identical with those of the Wisconsin habitats. So far, then, as I have been able to determine, var. *pinnata* is limited to Minnesota and Wisconsin.

Special attention was given the same season also to the occurrence of the var. *gracilipes* Fern. This variety is extremely interesting in the matter of its distribution. As was stated in my above-cited monograph of *Bidens* (p. 261), the type of var. *gracilipes* was a plant collected at Harwich, far out on Cape Cod, Massachusetts. A few other specimens were found, ranging from Maine to Connecticut. From the known facts at that time, therefore, var. *gracilipes* seemed to be an endemic variety of the northeastern United States. The researches of Fassett upon the Wisconsin Flora, however, revealed the presence of the variety at numerous sites in Wisconsin. Some specimens were cited by him in the paper referred to above (Rhodora *loc. cit.*) and many additional ones were collected by him later on, either singly or in the company of his students, and deposited in the herbarium of the University of Wisconsin. It was my privilege to examine all of these recently and to confirm his determinations.

Subsequent to Fassett's publications, Mr. and Mrs. Hanes, in their Flora of Kalamazoo County, Michigan (page 259. 1947) cited var. *gracilipes* for Kalamazoo County, Michigan. Later, I myself cited (Brittonia **11**: 190. 1959) a Hanes specimen for the same county. Again, in Rhodora of May, 1961, I cited material, *C. W. Bazuin 4282*, from the "sandy shore of Wolf Lake, 3-4 miles east of Muskegon, Michigan," a habitat "roughly seventy miles farther north and twenty

miles farther west than the habitat" where the Kalamazoo County specimen had been collected. Unfortunately the last two papers had been compiled with the thought of collaborating in the production of a new Flora of Michigan, which authorities at the University of Michigan contemplate publishing (*vide* Mich. Flora Newsletter no. 7, Univ. of Mich., Nov. 25, 1960) and thus I inadvertently described the Wolf Lake habitat as being "the farthest point west at which the variety .... was known to occur." The words "in Michigan" should have been added after "west" of course, to indicate a cognizance of the many habitats known to occur for the variety in Wisconsin. — Having the entire United States in mind, then, we may put Wisconsin as marking the western limit of distribution for var. *gracilipes*. Indeed, from the comparative abundance of var. *gracilipes* specimens in Wisconsin, it seems very probable that Wisconsin was the real center of origin for the variety, and that specimens found in New England states had originally grown there from achenes transported from the west, presumably with the aid of their retrorsely barbed aristae.

Returning to the occurrence of var. *gracilipes* in Michigan, I have been able, in the autumn of 1961, to find specimens of it growing in a seemingly discontinuous distribution beginning with Kalamazoo County at the south and extending northeastwardly into Ionia County, thence northwestward into Kent County and Muskegon County, thence far northnortheastward into Lake County, to a point (Wolf Lake) some seven miles north of Baldwin. Ample material was obtained for herbarium specimens and was turned over to the Chicago Natural History Museum for accession and distribution to other institutions. A list of *exsiccatae* by counties follows:

KALAMAZOO COUNTY: *E. E. Sherff XY6016*, sandy north shore of Eagle Lake,* Oct. 5, 1961: *Sherff XY6017*, sandy shore of east side of Eagle Lake, same date. IONIA COUNTY: *Sherff XY6015*, sandy spot on north shore of Jordan Lake, Lake Odessa, Sept. 29, 1961. KENT COUNTY: *Sherff XY6012*, sandy shore of Long Lake, east of Kent City, Sept. 18, 1961. MUSKEGON COUNTY: *Sherff XY6013*, sandy southwest

*This and the next references are to the Eagle Lake southwest of Oshtemo.

shore of Wolf Lake, Sept. 18, 1961. LAKE COUNTY: *Sherff XY6011*, sandy east shore of Wolf Lake, ±7 miles north of Baldwin, Sept. 6, 1961.

Throughout my examinations of var. *gracilipes* in the field at the above-mentioned Michigan habitats, attention was paid to the foliar variations in the direction of var. *pinnata*. Such variations were found to be rare. In the suite numbered *XY6016*, composed of some twenty or more small, depauperate plants, two were found to have several leaves each with two pairs of slenderly lanceolate lateral leaflets or pinnae, instead of a single pair of broader ones. Apparently this was the maximum extent to which var. *gracilipes* approached var. *pinnata*. To summarize, then, while the var. *pinnata*, as stated earlier, was not found to intergrade into var. *gracilipes*, the latter variety was found, though very rarely, to offer a slight approach in leaf-form to var. *pinnata*. There was no indication, however, that the two varieties were not distinct or worthy of being accorded separate status. — CHICAGO NATURAL HISTORY MUSEUM.

THE ANNUAL SPECIES OF HOUSTONIA IN ILLINOIS

ROBERT H. MOHLENBROCK AND LEO E. HALBIG

The genus *Houstonia* in northeastern North America is represented by two well-defined groups. One group contains delicate, vernal-flowering annuals with single-flowered peduncles, salverform corollas, and globular seeds. The other contains coarser, summer-flowering perennials with a compound inflorescence, funnelform corollas, and rather flattened seeds.

This paper is concerned with the annual vernal species in Illinois. A subsequent paper will be devoted to the perennial species.

Four or five species of the annual bluets occur in northeastern North America. (The discrepancy arises from the status of *H. faxonorum* Fern. or *H. caerulea* var. *faxonorum* Pease and Moore). Three of these are attributed to Illinois in varying degrees of abundance by different workers.